The Effectiveness of Numbered-Head-Together and Socrates Strategies to Promote Higher Order Thinking Skill in Speaking to High and Low Anxiety Students at SMK Zaenuddin Tegal

Naely Kamaliya Fitri[1], Dwi Anggani Linggar Bharati[2], Henrikus Joko Yulianto[3]

[1]Student of English Department of Semarang State University, Indonesia
[2]Lecturer of English Education Department of Semarang State University, Indonesia
[3]Lecturer of English Education Department of Semarang State University, Indonesia

Abstract - Higher-Order Thinking Skill (HOTS) is a crucial issue these days to prepare the students for the future. Indeed, English as an international language plays an important role. The purpose of this study was to find out the result of the application of NHT and Socrates strategies to Promote Higher Order Thinking skills for the students with high and low anxieties. This research is quantitative, where the findings are presented in the graphic or diagram with the calculation of results. The research indicators and scoring rubric are needed to conduct this research. The rubrics were to measure students' critical thinking and speaking in every meeting. The questionnaire was also needed to measure the student's anxiety. The result shows that the NHT and Socrates strategies affect the students with low anxiety to promote HOTS. Moreover, the NHT strategy is more effective to promote HOTS in speaking for students with high and low anxieties.

Index Terms : Effectiveness, NHT Strategy, Socrates Strategy, HOTS, Anxiety

I. INTRODUCTION

Teaching HOTS requires teachers to engage the students actively in teaching and learning activities. Some strategies can be applied in improving HOTS for students particularly speaking as an active skill. The strategies in this study are NHT and Socrates strategies, in which both of them use group-work but different treatment. Numbered Heads Together is a cooperative learning strategy that can be applied in teaching speaking. Numbered Heads Together is believed as one of the potential strategies that can encourage students to express themselves and potentially useful to encourage students to interact with each other orally.

F. Lam (2011) states that Socrates strategy employs questioning and critiquing orally. According to Socrates, a student is his or her own best teacher, and the way a student gains access to higher-order thinking and learning is by supplementing pre-existing knowledge with a thorough and rigorous ability to create, maintain, answer, and modify questions. A person who trains and disciplines his mind to think in a prescribed manner, consistently using the same set of procedures to guide that thinking, would be able to raise his standard of thinking. In the context of learning, this implies that students' critical thinking can be developed if teachers have the skill to conduct questioning and to ask appropriate questions. It can be concluded that students who were used to the practice of Socratic strategy will be able to conduct a more thoughtful and insightful discussion because they have higher critical thinking. Based on the explanation above, this study will employ NHT strategy and Socrates strategy to promote students' critical thinking into Higher Order Thinking Skill in productive skills –in this case speaking– to high and low anxiety students.

The objectives of the study are to analyze the interactions among strategies (NHT and socrates), student's HOTS in speaking, and student's anxiety; to analyze the effect of NHT strategy used for improving student's critical thinking in speaking among high anxiety students; to analyze the effect of NHT strategy used for improving student's critical thinking in speaking among low anxiety students; to analyze the effect of Socrates strategy used for improving student's critical thinking in speaking among high anxiety students; to analyze the effect of Socrates strategy used for improving student's critical thinking in speaking among low anxiety students; to analyze the different effectiveness between NHT and socrates strategies to improve student's critical thinking in speaking to high-anxiety students; to analyze the different effectiveness between NHT and socrates strategies to improve student's critical thinking in speaking to low-anxiety students.

This study covers the effect of NHT and Socrates strategies for improving students' thinking skill among the students with high and low anxiety level. Moreover, the teaching strategies will only be applied to improve students' thinking skill in speaking. This study uses a purposive sampling technique in which eleventh grade students in Zaenuddin Vocational School in the academic year 2021/2022. Nevertheless, the generalization of the result of this study also

requires further investigation. It indicates that this study cannot be stated to represent the whole students in the eleventh grade.

A. NHT (Numbered Head Together) Strategy

NHT is a cooperative learning model that holds each student accountable for learning the material. Students are placed in groups and each person is given a number (from one to the maximum number in each group). The teacher poses questions and students "put their heads together" to figure out the answer. The teacher calls a specific number to respond as spokesperson for the group. By having student's work together in a group, this strategy ensures that each member knows the answer to problem or questions asked by the teacher. No one knows which number will be called, all team members must be prepared.

Kagan (2011) believed that NHT leads the class through a series of steps designed to promote leaarning through cooperation, active participation, and individual accountability. NHT strategy indirectly trains students to actively participate, shares information, listens and speaks carefully, so that the students are more active and productive.

B. Socrates Strategy

Socrates strategy –also known as socratic method, socratic questioning– originates from Socrates, Athenian philosopher who lived around 470 B.C. Socrates was well-known in Athens due to his habit of engaging in philosophical conversations in public and at private gatherings. Those who learned from Socrates, will be inspired by love, devotion, and a sense of appreciation. Socrates reached the fame for engaging others in conversations whose goal was to define broad ideas such as virtue, beauty, justice, courage, and friendship by discussing their ambiguities and complexities. These dialogues were written by his student, Plato. Knox (1998) argued that Plato's *Dialogues* are the best source available for Socrates' method and philosophy. Socratic strategy seeks to implicate their previous knowledge, gained knowledge and future acquisition in the composition of arguments and hypothesis, observed Melissa (2015). The conclusion showed that socratic strategy not only posits the learner at the heart of their own learning experience, but also seeks to implicate their previous knowledge, gained knowledge, and future acquisition in the composition of arguments and hypotheses.

There are several key points in the Socratic strategy when it is applied for learning. Firstly, its learning objective is *inqui*ry. Its purpose is not to completely oppose students' original arguments but to partially modify their original arguments, observed Chang et al. (1998). The main activity in this strategy is a dialogue between student and teacher. The role of a teacher is to ask the questions and a students' role is to organize their past experiences and their knowledge in answering the questions. In addition, this method not only involves an interactive dialogue between teacher and students, but it is also inductive. The teacher continuously leads the students to reason incorrectly then uses the counterexample to clarify the problem.

C. HOTS (Higher Order Thinking Skill)

The theory of human thinking skills was classified by Benjamin Bloom at the beginning of 1956. Next, it was revised by Anderson and Krathwohl in the levels starting from remembering, understanding, applying, analyzing, evaluating, and creating. Those six levels are determined based on a) subject matter and b) the description of what will be done. In fact, the teacher arranges the syllabus to adjust the core competence and basic competence (Kemendikbud, 2016). The basic competence contains one or more materials of the lesson. On teacher preparation, the lesson plan ought to be based on the learning objectives. After that, the teacher makes it more specific to the competence achievement indicator (GPA). To determine the indicators, a teacher should comprehend the six cognitive levels. The levels show the thinking process from low order to the higher order. However, in arranging the syllabus and lesson plan which supporting HOTS, students expected to have more experiences and better knowledge.

D. Speaking

Speaking should be taught and then be practiced in the language classroom because the language course truly requires the students to communicate in English. Thornburry (2000) said that speaking is an interactive and requires the ability to cooperate in the management of speaking turn. Teaching speaking needs special treatment. In reality, people tend to speak more than writing. However, many English teachers still spend the majority of class time on reading and writing practice and often ignore speaking and listening skills. In a study measuring student's anxiety toward speaking skill conducted by Gafari (2013) concluded that collaborative learning can reduce student's level of speaking anxiety. It is a closest study that employs speaking and student's anxiety.

E. Student's Anxiety

The anxiety experienced by students is assumed to be a very important factor in a learning process. Many studies have been made to find the solutions to overcome this anxiety which might avert learners from learning to motivation. Rosen (2008) defined anxiety as a "major source of energy" and looked at anxiety as a positive factor. No one could escape from it since people live in an unpredictable society. Anxiety can be reduced when people change their perspectives in life.

Byrne (1984) argued that speaking becomes the major effect of language learners' anxiety. Oral communication is a two-way process between a listener and speaker (p. 8). Speaking involves both productive and receptive skills. As a

productive skill, a speaker produces and uses the language by expressing ideas and at the same time he or she tries to get the ideas or the message across, that is, the process of giving a message or encoding process. High school students confront many obstacles. One of the main problems they face is how to deal with anxiety especially student's anxiety, observed Vitasari et al. (2010). The result showed that student's anxiety affects academic performance, especially the students in high school.. The students at this age are facing a stage that is easy to pursue by people. It affects anxiety which can be high or low depending on their environment.

II. METHODOLOGY

This is a quantitative research. The research used 2x2 factorial experimental design. The object of this study was poromoting students' critical thinking into HOTS in speaking. The subjects were eleventh grader of SMK Zaenuddin – Tegal. Before the research begin, the students were asked to fill a questionnaire to measure the level of anxiety. After the data collected, the students were devided into two groups. The first group was treated by NHT strategy and the second group was Socrates strategy.

Along the study, the writer used speaking and critical thinking rubric to measure students' speaking improvement before and after the treatments. A two-way ANOVA will be used to compare groups that differ from one another along two dimensions or factors. The data was measure to find the average between both groups of sampling with different strategy. Then, the writer compared the score of each group bycalculating the mean of each group. After the data was obtained, then it was calculated to get the result of the research by using SPSS.

III. RESULT AND DISCUSSION

After the researcher got the student's data, then the researcher calculated and scored it to identify the student's anxiety level. It was conducted by computing the mean of the score. The score for strongly agree is 4, agree is 3, disagree is 2, and strongly disagree is 1. The result for experimental group one was that 15 students had high anxiety and 5 students had low anxiety. Then, experimental group 2 was that 14 students had high anxiety and 6 students had low anxiety. Each experimental group had high and low anxieties level.

A. Pre-test Score

The data of the pre-test and the post-test were obtained after conducting the the pre-test and pos-test. The data was calculated by using SPSS program. It was done in order to measure and to find out the effect of NHT and socrates strategies to promote HOTS in speaking among the students with high and low anxiety level. Below is the result of the the pre-test calculation on botih Experimental group.

Table 1. Statistics of the pre-test on Both Experimental Groups

	The pre-test NHT Strategy with High Anxiety	The pre-test NHT Strategy with Low Anxiety	The pre-test Socrates Strategy with High Anxiety	The pre-test Socrates Strategy with Low Anxiety'
Mean	43.23	56.87	45.91	62.16
Median	41.00	54.00	44.00	60
Std. Deviation	9.99	11.34	9.65	9.92
Minimum	25.00	46.50	33,5	53.50
Maximum	57.00	73.00	63.00	73.00

According to the the pre-test statistic above, it can be seen that the mean of the pre-test of student with high anxiety on the first group treated by NHT strategy is 43.23. On the other hand, the mean of the pre-test of students with low anxiety on the first experimental group treated by NHT strategy is 56.87. The standard deviation of student's the pre-test result on the first experimental group is 9.99 to 11.34 for both high and low anxieties level students RPL (Rekayasa Perangkat Lunak) class.

Meanwhile, the mean of students with high anxiety treated by Socrates strategy on the second experimental group is 45.91. In contrast, according to the table 4.1, the mean of the pre-test of the students with low anxiety level treated by socrates strategy is 62.16. The result of standard deviation on the pre-test for the second experimental group ranges to 9.65 to 9.92 for both high and low anxieties level in Multi Media class.

B. Post-test Score

After conducting pre-test and treatrnents for students, the writer gave a post-test to the students to find out the effectiveness of the strategies.

Table 2. Statistics of the post-test on Both Experimental Groups

	The post-test NHT Strategy with High Anxiety	The post-test NHT Strategy with Low Anxiety	The post-test Socrates Strategy with High Anxiety	The post-test Socrates Strategy with Low Anxiety
Mean	59.53	73.6	58.12	77.16

Median	59	78.5	58	87.5
Std. Deviation	12.61	18.69	13.49	17.89
Minimum	28	47.5	39	56.5
Maximum	73.5	90	90	87.5

The data of the pre-test was compared with the the post-test data. Based on the table above, the mean of the post-test of students with high anxiety in the first experimental group treated by NHT strategy is 59.53. On the other hand, the mean of the post-test of the students with low anxiety treated by NHT strategy is 73.6. The result of the post-test for the first experimental group range from 28-90 for both high and low anxieties students of RPL class. The scores have some improvements after NHT strategy was implemented.

For the second experimental group, the mean of the post-test of the students with high anxiety level treated by Socrates strategy is 58.12. Meanwhile, the mean of the post-test result for students with low anxiety level treated by Socrates strategy is 77.16. The score of the post-test for the second experimental group ranging from 39 to 87.5 for both high and low anxieties level students of Multimedia class. In conclusion, the the post-test result shows that the score was better that the pre-test. It can be concluded that NHT and socrates strategies had an effect for teaching speaking among students with high and low anxieties.

The first purpose of the study was to measure the significant effect of NHT strategy used for promoting student's HOTS in speaking among students with high anxiety. In order to decide whether the NHT strategy has significant effect or not is by comparing the mean of the pre-test and the post-test. The mean score of the pre-test was 43.23 and 59.35 for the post-test. The sig (2-tailed) value is 0.001 which is lower than 0.050. It means that the hypothesis of the study is accepted. In other words, it can be said that NHT strategy has significant effect for promoting student's HOTS in speaking among the students with high anxiety.

The second purpose of this research was to measure the significant effect of NHT strategy used for promoting student's HOTS in speaking among students with low anxiety. From the data, the mean score of the pre-test was 56.87 while the mean score of the the post-test was 73.62. The data shows there is a significant improvement after giving treatment by using NHT strategy for the students with low anxiety. Meanwhile, the Sig (2-tailed) value from the the post-test was 0.007 which is lower than α 0.050. It indicates that the hypothesis is accepted. It can be concluded that there is a significant effect of NHT strategy for promoting student's HOTS in speaking among students with low anxiety.

The third purpose of this research was about measuring the significant effect of Socrates strategy used for promoting student's HOTS in speaking among students with high anxiety. The mean score of the pre-test was 45.91 and 51.50 for the the post-test. Even though there was an improvement after giving treatment, the Sig (2-tailed) value from the paired test sample test was 0.082 which is higher than α 0.050. It means that the hypothesis is rejected, and the null hypothesis (H_0) is accepted. It can be said that there is no significant effect of Socrates strategy to promote student's HOTS in speaking among the students with high anxiety.

The fourth purpose of this study was to find out the significant effect of Socrates strategy used for promoting student's HOTS in speaking among students with low anxiety. The mean score of the pre-test was 62.16 and 83.25 for the the post-test. The mean score of the post-test is high enough than the mean score of the the pre-test. It means that there is an improvement after giving treatments for the students with low anxiety. It reflects on the Sig (2-tailed) value which is lower than α 0.050, it was 0.003. Because the Sig. value is lower than α 0.050, then the hypothesis is accepted. It can be concluded that the Socrates strategy had given significant effect in promoting student's HOTS in speaking among students with low anxiety.

The fifth research question of this study was about to find out the different of the two strategies (NHT and Socrates). It can be seen from the mean score of the post-test of both experiment groups after giving treatments. The mean score of the post-test of first experiment group treated using NHT was 76.42, while the second experiment group treated using Socrates strategy was 69.46. Meanwhile, the Sig. (2-tailed) value was 0.022. It means that the null hypothesis was rejected and the hypothesis of this study is accepted. According to the mean score of the the post-test, NHT strategy had better significant effect than Socrates strategy.

The next research question was to find out the influence of student's anxiety toward promoting HOTS in speaking. The mean score of the the post-test of the students with low anxiety was 80.35. On the other hand, the mean score of the the post-test of the students with high anxiety was 59.57. Furthermore, the Sig. (2-tailed) value of the student's anxiety was 0.000 which means that the value is lower than α 0.05. By doing so, the hypothesis is accepted. To sum up, there was a significant difference between the students with high and low anxieties after treated by using those two strategies. The students with low anxiety got better improvement after treated by using NHT and Socrates strategies than the students with high anxiety.

The last aim of the study was to find out the interaction between the strategies and the students with high and low anxieties. Based on the tests between subject effects, the Sig. value of the the pre-test was 0.371 and 0.231 for the post-test. The values are higher than α 0.050 which means that the hypothesis was rejected and the null hypothesis (H_0) of this research was accepted. In conclusion, there was no interaction between the two strategies and student's anxiety.

IV. CONCLUSSION

According to the finding, this experimental study has shown the effectiveness of NHT and Socrates' strategy used for

promoting students' HOTS in speaking among the students with high and low anxieties. Then, the mean of the pre-test and the post-test show that there is a significant improvement happened to the students with high and low anxieties after being treated by using those strategies. Based on the previous elaboration, NHT strategy is better to be applied in promoting HOTS in speaking to high and low anxiety students. The students were motivated to speak by their peers and encouraged by their conversation in the group. In addition, students' anxiety to speak reduced during the discussion along with the study. Especially after they had a long 'school from home' during the covid-19 pandemic, the students confessed that they forgot some vocabulary. Fortunately, the students help each other to memorize the vocabulary. The students seem confident to speak and answer each question in front of the class. Moreover, the Socrates strategy is effective in promoting HOTS in speaking for students with low anxiety. The students who are clever in the class seem prominent, but the students with high anxiety need more motivation from the teacher to speak and show their ideas. However, this study did not show the interaction between the two strategies, HOTS, and students' anxiety.

In other side, the writer agree that those strategies can be a good choice to be applied in promoting HOTS in speaking. The students were interested to the strategies which they had never gotten before. Beside, the strategies also can encourage their confidence in speaking English. It can help them improve their capability in studying and applying English in daily life, especially in their workplace after graduated from school. For the next researchers, they should conduct the research related to the implementation of NHT and Socrates strategies for promoting HOTS in order to get the better and precise result. Especially in applying Socrates strategy which is new in English teaching and learning process in Indonesia. Beside, they should do the further research related to the student's anxiety in speaking since speaking is a very important skill in learning languages. They can also conduct the research for different level or grade of students to find out which level should be appropriate to be implemented those strategies.

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